New Techniques in Vision Improvement

by Charles R. Kelley, Ph.D.

Charles R. Kelley, Ph.D., director of the Radix Institute and its California facility, the Radix Work Shop, has been active in the field of applied experimental psychology for more than twenty years. For thirteen years chief scientist and laboratory director for Dunlap and Associates Inc., one of the country's major human factors consulting firms, he was, during the four previous years, assistant professor and director of the Division of Applied Vision Research, Department of Psychology, North Carolina State College. He subsequently served as adjunct associate professor, New York University, as NATO visiting lecturer before major scientific institutions in Europe, and in 1970 as George A. Miller visiting professor at the University of Illinois.

Outside of academia he was a student of Wilhelm Reich, and contributed to Reich's journals when Reich was alive, and to the study of his theories in the years since Reich died. He was for five years editor of The Creative Process, *at a time when it was America's only scientific journal exploring Reich's concepts. He had previously become interested in the work of the ophthalmologist, William H. Bates, became an instructor, and for two years taught the Bates method of vision improvement.*

Dr. Kelley has been elected a Fellow in both the American Psychological Association and the Human Factors Society of America. He is a biographee in American Men of Science *and a member of the board of editors of* Human Factors. *He has lectured and given workshops at universities, growth centres and scientific organizations across Europe and America. He is author of more than fifty scientific publications on vision research and training, human factors research, and 'new education' techniques. The present article on vision first appeared in an expanded form in* Energy and Character *Vol.2, No.3, and Vol.3, No.1, September 1971 and January 1972. Parts 2 and 3 were first presented as a paper at the Institute for Bio-energetic Analysis,*

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Most people are surprised to learn that there are techniques that can substantially improve eye conditions usually thought of as fixed and incurable, such as myopia, hyperopia, and astigmatism. This contradicts the position of the medical and optometric professions that the eyes are a fixed optical element that cannot be modified except in unusual cases. The traditional position holds that education procedures can do no more than improve the interpretation of visual information which is of inherently fixed quality. Thus the basic visual input is conceived of as being unchangeable (save in rare instances) and the value of training limited to improving the way in which this fixed 'input information' is utilized, i.e., the process of interpretation by the brain.

My experience flatly contradicts this orthodox point of view. The view is contradicted by what I have learned as a scientist engaged in vision research, by what I have observed in students as a teacher of techniques of vision improvement, and by my direct experience improving my own vision. The eye is not an unchanging element bringing information of fixed quality to the brain for interpretation. The eye is a living organ, subject, like the rest of the body, to vicissitudes and variations of all kinds, especially in the functioning of the muscles within and surrounding it, and in the quantity and quality of the circulation delivering nutrients and carrying waste products from it. The eye, like the rest of the body, possesses an enormous capacity for change, both for the better and for the worse.

Vision changes all the time, and those with marginal vision are usually acutely aware of such changes. Vision is typically better in the morning than in the afternoon, better on a relaxed holiday than during an arduous period of work or study, better when relaxed and happy than when tense or emotionally disturbed. Nor is there any good reason for believing that it is not the 'visual

input,' the optical quality of the image on the retina, that changes, rather than (or in addition to) interpretive factors in the brain.

It is muscles which direct the eye's line of sight, focus its image through accommodation, and regulate retinal illumination. And it is muscles which interfere with function when they become too tense or too flaccid, either condition interfering with ocular mobility and impairing circulation. It is mobility and circulation which the eyes require above all for both function and health. It is muscles, then, that are the primary agent for visual change.

The mechanistic view of the eye as a fixed optical system is a myth, full of contradictions and inconsistencies. The same practitioner who insists that it is impossible in principle for a ten-year-old with one and a half diopters of myopia to reduce his myopia to zero in two years of training must in honesty admit that it is very possible indeed for the 1½ diopters of myopia to increase to 3 diopters in the same two-year period. The eye that is regarded as mechanically fixed with no potential for change in the direction of improvement is at the same time recognized to be flexible and subject to substantial change when it comes to getting worse.

And it is the same with other eye conditions. Muscular tension and impaired circulation can, and do, become worse, and worsen the optical performance of the eye. Can they not also, then, given the proper changes in conditions and habits, become better? They can, of course, even though they seldom do. The truth is that vision can be improved by training, but seldom is *because vision professionals do not know how.* But one can learn a little about it, if he is willing to consider the experience of unorthodox practitioners.

I began work in vision improvement techniques as a teacher of the Bates method, and, seeing the need for research, became an experimental psychologist specializing in vision. The article begins with a personal account of my experience in the field of training and research in vision improvement. I then present a new theory of myopia and hyperopia which has gradually evolved over the past twenty-five years. The final section deals with the problems of vision improvement, contrasting more orthodox

approaches with that taken in the Radix Institute vision improvement programs.

*Part I: Personal Experience**

Having to wear glasses was a real blow to me as a child. I was a skinny, gangling boy of nine when I was first required to wear them, precocious and aggressive intellectually but fearful and shy emotionally. I was tall for my age, and awkward and uncoordinated, especially in comparison with my classmates, who were usually a year or two older. I felt myself to be weak, unmasculine, a sissy, 'out of it' with my peers. Glasses contributed greatly to my bad self-image. Only two decades later as a research psychologist did I discover how typical my pattern was for a myopic child, and that the myopia derives from the fearfulness and emotional withdrawal that precedes it and forms its base.

Not every nearsighted child has the determination I did to change myself, although many do. I pushed myself into athletics, and when I went into high school, into dancing classes, social events, and into dating. I became big, muscular, and more acceptable socially. Because of my intellectual aggressiveness, I was a leader of certain kinds of activities — manager of the debate team, president of the Young Unitarians. But what I felt to be the 'real me' under the muscular and verbal front remained a thin-skinned, easily embarrassed boy, hating the metal-framed glasses I was supposed to always wear but didn't, suffering agonies when a girl turned me down when I asked for a date or even a dance. And this 'real me', I know now, formed the characterological base of my vision problem.

And my eyes got steadily worse. Once or twice a year I was sent to the ophthalmologist, and after duly peering through the pupils, expanded by drops, with his retinoscope, and running me through his trial lenses, his 'remedy' was always the same — stronger glasses. One year I wasn't allowed to read or do close work, and spent my school hours in pottery, wood shop, and the

*A prior section discussing the Bates method has been omitted for reasons of space.

like. It did nothing to keep my eyes from getting worse. In high school and after, they only got worse a little slower.

When I got out of the army at twenty-three, I was able to barely read the largest letter on the eye chart at twenty feet with my better eye. My acuity was 20/200 in the left eye, 20/400 in the right, which means that an eye chart letter had to be 10 times as high for me to see it with my better eye as for a normal-sighted person. Glasses gave me 20/20 vision, but I still hated them, and had found that using them tended to make my eyes worse.

It was then that I read Aldous Huxley's book, *The Art of Seeing*, in which he described his experience with the Bates method, and the big improvements in vision near-sighted people had obtained through it. I contacted Mrs Margaret Corbett, Huxley's Bates teacher, and the leading exponent of the method after Bates' death. Mrs Corbett referred me to an instructor trained in her school, and I started Bates lessons, at first 3 times each week, 90 minutes each, with a daily homework program. Later I was dropped to two, finally to once per week.

I worked diligently, and my vision responded. In six months, the eyes that had for a lifetime only got worse became able to read 20/20 chart letters unaided and without squinting or other tricks, in virtually every lesson. These gains were temporary, but my basic test vision improved to 20/70 in the same period, with flashes of clear (20/20) vision at increasingly frequent intervals. By the end of two years I tested 20/40 under even unfavorable test conditions. I then passed my driving test without glasses, as I have done 8 or 10 times subsequently in four different states.

My vision has remained variable, and at times normal, but for the most part I have remained somewhat myopic. My optical correction to a consistent 20/20 had reduced to −1.25 diopters in each eye, where originally it was −2.75 in my better and −3.25 in my worse eye. It is difficult to get a precise refractive error figure on me, as my refractive condition varies substantially, even under cycloplegia, the drops in the eyes used by doctors to paralyze accommodation and expand the pupils.

I became a Bates enthusiast during my first year, and enrolled in Mrs Corbett's teacher training program. After completing the course and qualifying as an instructor (which took a year of work)

I practised as a Bates teacher and worked for my degree in psychology at the University of Hawaii. For more than two years Bates teaching was my primary occupation and means of livelihood. In those years and my year of training with Mrs Corbett, I learned more about the causes and methods of improving common visual problems than even the most 'advanced' orthodox practitioners in the vision sciences ever discover. This was still not enough to satisfy a fraction of the questions my practice raised.

My students improved substantially when they worked at it. Improvement was usually gratifyingly quick at the start, but then it slowed down. The factors that brought improvement were mostly psychological, and increasingly so as we worked. Bates' simple drills for relaxing, sunning, and mobilizing the eyes became more and more preparation and groundwork for the central problem in vision improvement, which was (as both Bates and Mrs Corbett had taught) primarily psychological. I learned intuitively, by doing it, that when I could get my students' confidence, when I could get them to relax *emotionally*, when I could get them to develop freedom from apprehension, from anger or suspicion, and from emotional pain, when I could get them to imagine pleasant scenes, their vision 'turned on.' Huxley spoke of 'dynamic relaxation' as the state that allows vision to 'turn on.' What he (like Bates and Corbett) failed to emphasize sufficiently was the deep emotional roots of the tensions blocking this state of dynamic relaxation.

Because my understanding was intuitive and not yet conceptual, I struggled blindly for better techniques to bring vision to my students. The effort required with some students was prodigious. The nearsighted students (most of my students were nearsighted) were thin-skinned and vulnerable, and especially so when they opened up and their vision 'turned on.' Working with them — especially those with higher degrees of myopia — required me to 'walk tip-toed on egg shells.' When I could get myopic students to laugh, get them to trust, get them to expand, their lesson went beautifully; improvement from 20/100 to 20/20 or better during one lesson in my studio was not uncommon. But let me lift an eyebrow wrong, let the slightest trace of impatience

or irritation creep into my voice, and there went my student's vision! It became a great strain to teach many of these students. When they called and cancelled a lesson, I felt such relief — even though I needed the money to pay my rent.

Had I understood fully why it was such a strain, I could have coped more effectively, but I was operating on feeling. Neither Bates nor Corbett provided an adequate conceptual base for me to understand what was going on. I did not then realize that no such base existed anywhere, and I kept reading and searching, struggling after knowledge that did not exist. I soon realized the need for research, and was drawn increasingly toward a career in research in the psychology of vision.

Perhaps the most eminent psychologist specializing in vision at that time was Professor Samuel Renshaw of Ohio State. Dr. Renshaw was the architect of the U.S. Navy's Aircraft Recognition Training Program of World War II. He was also the psychologist mainstay of the 'Optometric Extension Program,' a radical, psychologically-oriented group of optometrists. However, the most advanced thinker I could find on the emotional problems of the kind that I faced in my students was Wilhelm Reich. I resolved to learn what I could from both men.

After graduating from the University of Hawaii, I was accepted as a graduate student under Renshaw in the fall of 1949 and, after a college quarter, became a research assistant to him. I earned my master's degree under his direction the following year. Renshaw made a great deal of use of tachistiscopic techniques. Words, numbers, or patterns were employed that the student tried to reproduce from a flash (tachistiscopic) exposure of a twentieth of a second or less. This tachistiscopic training not only improved the recognition of visual form but, Renshaw observed, sometimes decreased myopia among students.

Working for Renshaw, I developed a means for generating random visual patterns of any desired level of difficulty for use in tachistiscopic training. I also learned the thoroughness, discipline and patience required of a good experimentalist, and I acquired a great amount of knowledge about the psychophysiology and the experimental psychology of visual perception. I became familiar with the optometric and medical as well as the psychological

literature on vision. Nowhere was there anything that threw light on my experience with vision improvement via the Bates method. Psychology, optometry and ophthalmology did not even recognize that such improvements took place, much less investigate how and why. Everyone among the orthodox was caught up with the study of mechanisms, and the mechanism of vision is exceedingly intricate and interesting. No-one was working with the emotional functions producing visual problems.

But Wilhelm Reich and his students were into the bodily basis of such emotional functions, and were employing powerful techniques of emotional release based on Reich's discoveries. I went to New York to study Reich, and to go into therapy with a doctor he had trained, while I worked for my Ph.D. In New York I took my first professional job as an applied experimental psychologist, and I enrolled as a doctoral student in the New School for Social Research.

My major professor at the New School was Dr. Hans Wallach, a fine experimental psychologist working in the area of visual perception. My doctoral dissertation under Dr. Wallach was entitled 'Psychological factors in myopia.' I investigated the medical and optometric theories of myopia, to be discussed later, and I studied research on the nature and correlates of myopia, both in the physiological and psychological realm. I went back over the improvement of vision of myopic students I had taught as a Bates teacher, on whom I had kept careful records. Most significant, I did an experimental study on the use of psychological techniques derived from the Bates method to improve myopia. Using optical instruments from the former School of Optometry at Columbia University, and working in the Optometric Center of New York, I showed conclusively that:

1 Myopia is not a fixed optical condition, but a plastic and variable one.

2 Large temporary improvements in myopia could be produced by the techniques derived from Bates.

3 The improvements were not due to improved interpretation of blur, contraction of the pupil, tears on the cornea, or to changes in shape of the lens (accommodation).

4 The changes were unaffected by cycloplegia (drops in the eyes).

There is a strong presumption from my data that the improvement in myopia of the experimental subjects was due to a change in the length of the eyeball as a result of action of the extrinsic muscles of the eye. Bates had said that myopia was due to contraction of these muscles. The implication of the study was also that permanent improvements in myopia should be possible using the techniques I had employed.

The study created a minor stir. It was awarded the Alumni prize as the finest dissertation of the university in the 1957-58 academic year. It was presented to the American Psychological Association convention, printed in a summary article in the *Journal of the American Optometric Association,* written up in *Time* magazine and the *New York Times,* recorded and broadcast over radio stations in New York and California. With that, interest died. Its effect on the vision professions has been nil. This carefully controlled research program has never had a fraction of the influence of, for example, the attack on Bates and his work by Martin Gardner in the book *Fads and Fallacies in the Name of Science*. Gardner had no educational or professional qualifications for discussing Bates, did no serious investigation of Bates' claims, and condemned out of hand Bates and those who reported deriving benefits from Bates' work. The article was full of 'authoritative' pseudo-scientific pronouncements, attacks on Bates' character, and gross and ignorant distortions of his scientific position. Gardner's attack on Bates and its widespread influence infuriated me. It is best described as an example of the pseudo-scientist urinating on his scientific betters. This practice is very safe; indeed, it is encouraged, as long as the victims are espousing an unorthodox position.

The attitude toward Bates' work generated by Gardner's attack and others like it make it possible for the optometrists and medics of New York to band together to have the Bates method outlawed in New York State. I still get letters on occasion from people in New York wanting to know where they can get Bates training. Many of these correspondents are in desperate visual condition, and I know with certainty that Bates' work could help

some of them. I sometimes feel like writing them to go blind, courtesy of Martin Gardner and their local medical and optometric associations.

Despite my vindication of Bates' claims, techniques to change the underlying emotional factors in myopia and other visual disorders were still lacking. My dissertation provided no new methods of training, but only confirmed the effectiveness of some of those I had used as a Bates teacher. I could not, in my dissertation, go into the application to vision problems of the deep emotional release techniques of Wilhelm Reich. This was both because I was not ready, and because these techniques were too unorthodox and emotion-charged to be accepted then in even as open a university as the New School for Social Research.

But my experience in Reichian therapy confirmed that I was on the right track. My therapist was Dr. Wm. F. Thorburn, an osteopath trained by Reich. My vision was much affected by the Reichian emotional release techniques he used, and in a different way than had occurred in Bates lessons. For example, when I learned to cry again with Dr. Thorburn's help, it freed my eyes and changed the quality of my visual experience. I had not cried for twenty years, and it 'opened my eyes' in a very different sense than Bates lessons ever had.

On the way to and from Dr. Thorburn's office I passed the window of a large, well-arranged florist shop. After the appointment the colors and arrangements of these flowers appeared strikingly vivid, and affected me deeply. I would stop and gaze at them in a kind of wonder. The whole visual world was opened up to me in a new direct, intense form of visual perception. Other students in Reichian therapy reported experiences similar to mine. Some also reported lasting improvements in vision, and a few discarded glasses as a result of their Reichian work. The latter were exceptional cases.

What was needed was someone to put together Bates' and Reich's work in a new synthesis. I was the right person from the standpoint of knowledge, in fact, the only person who could, but I was not yet ready emotionally.

Dr. Thorburn died in 1960. I moved back to California in 1963. I was fortunate enough to find my way to Dr. Philip Curcuruto,

who proved to be among the most skilled of Reichian practitioners I had met. (I had met many in a dozen years' association with the Reichian movement.) Even so, five more years of hard work were required for me to complete my Reichian analysis. This was in 1968, then, twenty years after I first grasped the potential importance of Reich's techniques as a Bates teacher and undergraduate at the University of Hawaii.

But I was quite a different person characterologically. The deep myopic fearfulness was gone. Still intellectually aggressive, I was also much more open and spontaneous emotionally, confident in personal relations.

And I was twenty years older. I had been highly successful in my work as an applied experimental psychologist, and was now internationally known, with a book and scores of papers to my credit. My scientific work on vision had been limited to such things as studying optical information gathering on the Apollo mission, heads-up displays for Naval aircraft, motor vehicle rear vision systems, etc. Much of what I did didn't involve vision at all, and none of it vision improvement, as my scientific interests had expanded into other fields. My vision training skills had only been kept alive through the years by people who knew my background, and who came to me privately to learn what they could do for their own or their children's vision problems.

In 1967 and 68 my wife Erica and I laid plans for the first group of volunteer myopes to undergo a combination of Bates, Renshaw and Reich techniques aimed at improving their vision. The techniques we developed for the group were original, rooted in my understanding of these men's work, but brought together by us in a new synthesis. Bates and Renshaw techniques were modified to reflect my understanding of the deep emotional basis of visual dysfunction. Changing the student emotionally or characterologically to free him from the factors which generated his visual problem was our first concern. The specific vision improvement techniques then became important, so that the emotional change could be translated into improved vision.

Our first group of five volunteers met in our home for twelve weeks starting in January 1969. It was techniques of emotional release rooted in the concepts of Reich to which we gave major

emphasis. They worked. We reached deep levels of spontaneous emotional discharge in most sessions with most of our students, though it took up two of the three hours of each meeting, working with each student in turn, to do so. The specific vision techniques were less effective than they could have been due to lack of time. Renshaw tachistiscopic training needs at least 3 half-hour sessions per week, for example, and we had time for only 15 or 20 minutes in our 3-hour once-a-week group meetings.

Nonetheless, all of our students changed visually. The average 12 week improvement in vision was equivalent to two lines on the eye chart. But in assessing the significance of the experiment at the end of our twelve weeks of work, the student agreed that the emotional changes they went through were more significant to them than was the improved vision. (One student said they were 'equally significant.') And all agreed that the changes were deeply significant. We really didn't have to ask; we could see them happen as we worked.

Since that time, those students who continued to work have continued to improve. One originally highly myopic student has reduced her optical correction by 3/4. A less myopic student has now brought his test vision up to 20/20. Optometrists confirm our students' improvements. And so we started offering classes in this work. As of this writing, half a year later, its vision improvement program has only begun to attract students. But for those students who have come, the program is proving its power.

Our classes, workshops and individual instruction in vision improvement have the potential for becoming the most effective program for the improvement of vision that has ever been offered. The program is new, however, and there is so much to learn that we feel we are only beginning.

Part 2: Myopia and Hyperopia

Myopia (nearsightedness) is a condition in which the eyeball is too long relative to the strength of the eye's optical elements (cornea and lens). The image of distant objects is focused in front of the myope's retina, and a negative (diverging) lens, thin in the middle and thick at the edges, must be placed in front of the eye

to bring the plane of focus back to the retina. Myopes of any degree suffer very poor distant vision — worse than most people realize. It is not unusual for the myope to be unable to read the largest letter on a standard eye chart at 20 feet without glasses, and many must approach to 2-6 feet of the chart to distinguish its largest letter.

Hyperopia or hypermetropia (farsightedness) is the opposite condition to myopia, for in it the eyeball is too short relative to the eye's optical elements. When the hyperopic eye relaxes, the image of distant objects is focused on a plane behind the retina. A positive (converging or magnifying) lens, thick in the middle and thin at the edges, is required to bring the plane of focus forward to the retina. It is more difficult to detect hyperopia than myopia, because the eye can increase its own focusing power by accommodation. Accommodation is the function that makes it possible for the normal eye to adjust itself to see nearby objects clearly through an increase in the thickness of the lens of the eye. (The myope cannot accommodate in reverse to see distant objects more clearly.) If the hyperopic eye accommodates an amount just equal to the amount of hyperopia, the lens thickens enough that distant objects will be focused onto the retina, and so seen clearly. Nearby objects can also be seen clearly as long as there is enough *additional* accommodation present to adjust the eye for the closeness of the objects viewed. The hyperopic lens must thus thicken more to see near objects than does the lens of the normal eye.

Whereas the typical myope is most bothered by the blurring of his distant vision, the typical hyperope is bothered by eye strain or fatigue, difficulty in concentrating for long on near-point work, problems in focusing the eyes, and by the tendency for print (and other objects viewed at near point) to blur at an earlier age than they do for others. Hyperopes are far more subject than myopes to eye headaches, crossed eyes, and reading difficulties. Small degrees of hyperopia are common, especially with young children, but among adolescents and adults, large degrees of hyperopia are not nearly as common as large degrees of myopia. Much more has therefore been written about possible causes of myopia than of hyperopia.

Perhaps the four most widely held theories of myopia causation (the first and last of which are also theories of hyperopia causation) are:

1 *Genetic theory* — myopia and hyperopia are inherited conditions.

2 *Nutritional theory* — myopia is a product of diet.

3 *Conditions of use theory* — myopia is the result of the excessive use of eyes for near-point tasks.

4 *Normal biological variation theory* — myopia and hyperopia are, in most cases, only the reflection of normal variation in the length of the eyeball and the strength of the eye's optical elements.

The evidence against each one of these theories is substantial. I have reviewed it in detail elsewhere (Kelley, 1958) and will only summarize the main points here.

Genetic Theory

The belief that myopia (and hyperopia) is inherited does not hold up to scientific examination. True, myopia tends to run in families, but this is true of a great many acquired conditions and behaviors. The best studies of human inheritance are of identical twins, since only such twins have identical inheritance. Studies of twins by Hofstetter and Rife (1953) and Meyer-Schwickerath (1949) show that identical twins don't have the closely similar degrees of myopia that the genetic theory demands. Population genetics based on correlations of refractive error and other body measurements in a study of a great many families confirm this conclusion, making it ...

> ... highly unlikely that static refractive error (myopia and hyperopia) is primarily hereditarily determined. (Young, (1958).

The best that can be said of the role of inheritance in myopia and hyperopia is that some people may be especially prone to these conditions due to constitutional factors (Henderson, 1934). It is quite possible that there are inherited constitutional differences

that make some individuals more or less susceptible than others when they are exposed to the factors which cause these disorders of sight.

Nutritional Theory

The nutritional theory of myopia is that dietary deficiency or imbalance affects the eye's structure in such a way that myopic elongation occurs. The great differences in myopia incidence between cultures might be accounted for in this way, e.g., the notoriously poor diets and high myopia incidence in the orient. The fact that first generation American children of European parents have an incidence of myopia like that of other Americans rather than like that of the country of their parent (Nadell and Hirsch, 1955) is also evidence against a genetic and for a nutritional or other environmental theory. However, studies of the diets of myopes have not shown consistent dietary differences between myopes and non-myopes living in the same culture that could explain myopia. The incidence of myopia is higher among the well fed professional segment of the population than among the badly fed poor, for example.

There is one interesting fact that has emerged from research on dietary factors related to myopia. Young myopes tend to have depressed blood calcium compared with controls (Wood, 1927; Law, 1934). There is no evidence that this is due to their diets, however, nor that administration of calcium and vitamins (Knapp, 1939; Stansbury, 1948) arrests the progress of myopia.

Conditions of Use Theory

There is a close correlation of myopia incidence with the conditions of civilized life, which includes such a great increase in use of the eyes for near-point work. In civilized countries, school work alone results in an extremely large added use of the eyes at reading distance during the childhood years in which most myopia develops. The occurrence of myopia is low among pre-school children and increases tremendously in the school years. It continues to increase in association with education from grammar school through professional schools. Too, myopia has a lower incidence among peasants, farmers, and primitive people

than among the highly educated professional classes.

Any adequate theory of myopia must account for these facts. Simplistic explanations quickly run aground, however. Thus while it is true that myopic children tend to read more than others (Young, 1955) it does not follow that the reading causes the myopia. More than average reading could be a result of the myopia, for example, or both myopia and the tendency to read a lot could be the consequence of a third factor. This factor could be, e.g., a type of over-all character or personality development that is associated with both myopia and a predilection for reading. In point of fact, there are dozens of studies, spread over seventy years, to show that severe curbs on reading, use of large type, strict control of lighting, etc. etc., does *nothing whatever* to reduce the incidence or slow the progress of myopia. Vision hygiene programs have failed repeatedly as myopia preventatives. Occasional positive results have been reported, but have not held up under massive and repeated investigation. The conditions of use theory of myopia, attractive as it is on many counts, has failed to prove its case (Nadell, *et al.*, 1957; Stansbury, 1948).

Biological Variation Theory

Yet another theory of myopia and hyperopia, somewhat akin to the genetic theory, holds that hyperopia and most myopia is the result of normal biological variation in the eye's structure (e.g., Sorsby, 1934). The theory holds that just as some people are much taller or shorter than others, or have longer arms and fingers, some people have longer eyeballs or shorter eyeballs relative to the strength of the eye's optical elements. In this view, if your eyeball happens to be too long, you are myopic; if it is too short, you are hyperopic.

This theory is refuted by two lines of evidence. First, the myopic eye follows an entirely different pattern of development from the normal eye. The normal-sighted child stays normal while the usual myopic child at age 8-12 becomes progressively more myopic, often changing markedly in a few years (Hofstetter, 1954). This means that something is happening in the myopic eye that is decidedly not merely normal biological development.

More technical but equally telling is a statistical point. Body dimensions that are subject to normal biological variation, such as height, leg and finger length, etc., are distributed in the population at large according to a 'normal distribution curve,' with most people at the center or average value, and decreasing numbers the further away from average one goes. The exact mathematical nature of this curve is well known, having been discovered by Gauss over a century and a half ago. Eye measurements (refractive error) conform to the normal distribution curve early in life, but their distribution becomes increasingly abnormal over time (Wibaut, 1926; Hofstetter, 1954). The adult curve of refractive error in the population bears little resemblance to the normal distribution curve.

Figure 1 shows one such curve for a large sample of adult male Americans, together with a best fitting normal curve. Two major changes have taken place to distort the shape of the actual refractive error distribution from the 'expected' normal shape:

1 Cases are stacked up in the central (normal vision) portion of the curve ('leptokurtosis'). This indicates that the eye has a means of correcting at least small errors in refraction toward normal.

2 The curve is very skewed in the negative (myopic) direction, showing that a large minority of the population has become myopic.

There is nothing in these data to support the theory that myopia is a 'normal biological variation.'

The Mechanism of Myopia and Hyperopia

Stenstrom (1948) showed that variations in adult refractive error are almost entirely the result of differences in elongation of the eye. The two tendencies distorting the original normal shape of the curve of refractive error are thus due to a factor that affects the relative length of the eyeball. Bates believed, and the evidence from my own studies of myopia confirm, that this factor is the extrinsic muscles of the eye. Bates' research indicated that the two oblique muscles belting the eye around the middle were responsible for lengthening the eye, and, if they were chronically

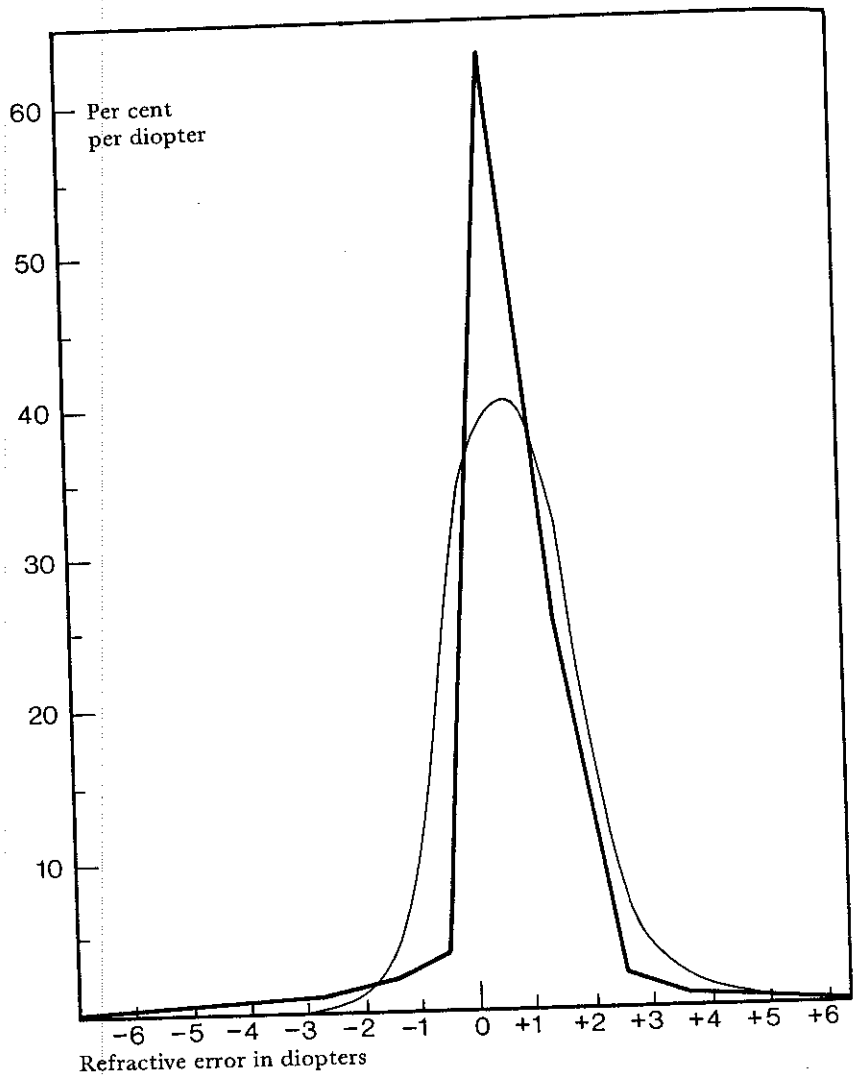

Figure 1
Frequency curve of refractive error among adult male Americans (thick line) and best fitting normal curve (thin line). (From *Stenstrom's Treatment of Original Data* by Stromberg; Stenstrom, 1948, p.31.)

tense, they produced myopia. Opposed to the action of the obliques, he held, were the four recti, extending from front to back of the eye. These, according to Bates, flattened the eye and, if chronically tense, produced hyperopia.

Bates believed that these same opposed muscle groups were responsible for accommodation of the eye, the obliques lengthening the eye for near vision, the recti flattening it for the distant view. There is substantial evidence that this is not the case and that the eye instead accommodates by action of muscles within the eye which change the shape of the lens (Helmholtz theory).

The incorrectness of Bates' theory of accommodation says nothing about the validity of his theory of refractive error. Since there appear to be two mechanisms affecting the refractive condition of the eye, one internal and one external to the eyeball, it was natural for Bates, discovering one of these mechanisms, to generalize that it also performed the second (accommodative) function. Other vision scientists have frequently made the converse error, trying to explain most myopia in terms of the accommodative mechanism within the eyeball. A special x-ray technique for measuring eyeball length had to be developed before it was established that the mechanism of myopia was, instead, eyeball elongation (Stenstrom, 1948).

Dynamics of Myopia and Hyperopia

Myopia and hyperopia are due, then, to relative elongation or flattening of the eye by the extrinsic muscles. Yet this refers only to the mechanism of refractive error, and not the underlying cause. The elongation of the eye in the direction of myopia by the oblique muscles is a kind of flexor action; the opposed direction, flattening the eye in the direction of hyperopia by the recti, is a kind of extension. This identification of a direction inward or outward is an indicator of the nature of myopia and hyperopia that is consistent with a Reichian body energy concept. In myopia the direction is inward, contractive, toward the self. Hyperopia is the reverse, i.e., outward, expansive, away from the self.

Several psychological studies of myopia and a few of hyperopia show that there are character and personality traits associated

with these conditions (e.g., Young, 1967; Rosanes, 1966). Studies prior to 1958 have been reviewed elsewhere (Kelley, 1958). Table 1 summarizes important differences between myopes and hyperopes. These are generally consistent with the research literature, but go beyond it. The findings on body structure and function are (except for the first two) based on my own experience in vision improvement work.

Generalizations about the body and character dynamics of myopes and hyperopes must be made with due respect for the individual development process. The tendencies described in Table 1 refer to early, deep dynamic factors that are reacted to in many different ways. Some myopes remain shy, withdrawn, seclusive, and sedentary all their lives, for example, while others 'take themselves in hand' — often in adolescence — and force themselves to compensate. They may then go into athletics and/or social activities, for example. The myopic gymnast, weight lifter or football player, in my experience, has usually started into athletics to compensate for his deep underlying fearfulness, working to erase the suspicion that he is a 'sissy'. As a result of his compensation, his superficial appearance may contradict features of the description of Table 1. And virtually every student coming in for training has armored against, not just one basic emotion, but all of them. Thus some degree of blocked grief, rage and fear show themselves in myope and hyperope alike. Some of these blocks are later and more superficial than others. With the myope the early, deep fundamental block is of fear; it is often necessary to peel away shallower layers of armoring to reach this level. With the hyperope, however, the anger block is fundamental, and his deep rage must ultimately be reached and released, whatever surface layers may cover it.

Some of the behavioral observations that Table 1 is based on (aside from those of body structure) may help show how this understanding of myopia and hyperopia was reached. In the build-up of strong emotion that develops while using neo-Reichian techniques of emotional release, certain students develop an almost uncontrollable tendency to close their eyes, often clenching them tight despite repeated instruction to open them. It is clear from their timing and manner that this is a fear

TABLE 1

Tendencies often found in myopes versus hyperopes

Myope	*Hyperope*
Character and Personality	
inward, introjective, self-oriented	outward, "other" oriented
shy, withdrawn as a child	aggressive as a child
"good" in school	often a behavior problem in school
childhood "temper tantrums" rare	childhood "temper tantrums" common
stubborn, emotionally inflexible	more yielding to external pressure
more at home with self, uncomfortable with others	more at home with others, uncomfortable with self
often "off" in day dreams, subvocal thought	alert, aware of environment
comfortable with eyes closed; retreats from visual perception inward	uncomfortable with eyes closed; retreats from the self outward
Body Structure and Function	
underactive, often sedentary	hyperactive
body soft, sometimes flabby	body tense, hard, wiry
throat, high chest, jaws, back of neck, scalp — chronically tense; jaw rotated forward, forehead back; shoulder forward	eyes, side of neck, back — chronically tense; forehead rotated forward, chin back; shoulders back
disconnected from feet; "up in the head;" centered but poorly grounded	better grounded, but less well centered; "out into the muscles"
voice often breathy or husky; becomes hoarse easily	voice more often clear
chest often depressed; breathing blocks on *inspiration*	chest often expanded; breathing blocks on *expiration*
fearful; blocking terror	angry; block rage
Eyes	
usually large-looking, open; very little local armoring around eyes	usually smaller-appearing; much local armoring around eyes
squint, fusion problems not common	squint, fusion problems frequent
unusual to have pain, eye headache	pain, headache common
eyes lack sparkle, brightness	eyes bright
eyes look down or away in anger	eyes spark, look at one in anger

response, a frightened shutting off of the visual world. (The eyes will also close in grief, but the student has no trouble opening them if so instructed.) I have witnessed this fearful eye-closing reaction hundreds of times, yet it is *only myopes* who do it; I have very rarely taught a hyperope that reacted in this way.

If the hyperope is instructed to close his eyes, it rouses anxiety; his natural tendency is to keep his eyes open as his feelings build. For this reason it is often difficult to teach a hyperope to palm successfully, i.e., to close the eyes and cover them with the palms in the way Bates recommends. The instant either the student himself or his vision teacher speaks, the hyperopic student tends to take down the palms, open the eyes, and look at the teacher. — Yet I've never known a myope to do this.

In a workshop full of myopes, the teacher must continually work to keep the group in motion. When not carrying out drills or instructions, the myope tends to stop activity, to sit, lie down, or just stand, but in any event, to become inert. In a group of hyperopes, the usual problem is to get the students to shut up, be still, and pay attention enough that instruction can proceed! These facts, known, I think by every Bates teacher, were confirmed in the doctoral research of Rosanes (1966), which showed that hyperopes express anxiety by increased motor activity, myopes by decreased motor activity.

When a compensatory posture has not obscured it, the basically fearful body expression of the myope is clearly evident. The shoulders are held forward and often dropped, the chest deflated. The skull is rotated chin forward — forehead back, as if a blow were expected. The flexors at the back of the neck, a key point in the myope's body armor, are primarily responsible for the myope's typical neck posture (see Figure 2). They pull the head back and into the torso. The throat is highly energized, blocking and holding against the fear. Inner thinking with sub-vocalization is common, and helps keep the myope 'in his head.' The forehead tends to be smooth and pulled back by the tense scalp, the eyes opened wide, but with a certain deadness of expression. The eyes of the myope lack sparkle and life, and pull back from contact, even as they look at you.

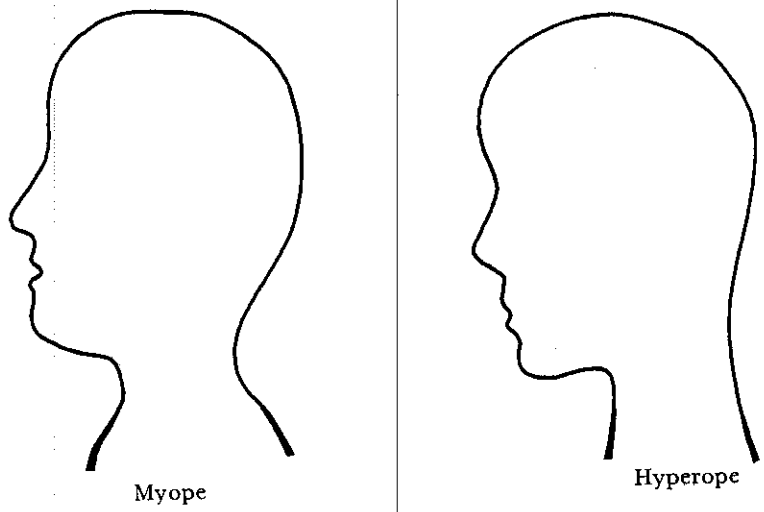

Figure 2 Typical myopic and hyperopic head posture.

The hyperopic posture is stiff, expressing the held-in anger. The shoulders are often pulled up, the chest held full and high. The skull is rotated forehead forward — chin back, making the head stiff and tall. The tense muscles at the side of the neck tilt the head forward, and also prevent the head from turning easily from side to side. There are often heavy tensions in the brows, lids and extrinsic eye muscles, and the eyes themselves may appear small because of the armoring around them. The extra-ocular muscle tension causes a tendency to stare, and interferes with coordinated binocular eye movements. For all this eye armoring, the eyes of the hyperope are usually bright and lively in expression compared with those of the myope. The eyes will flash in anger, which myopic eyes do not do, and eye contact is usually sought. There may be less energy and holding in throat, mouth and jaw than with the myope, however. The thought processes of the hyperope are frequently visual rather than sub-vocal. He is less often off 'in his head,' but is frequently scattered and away

from his center, i.e., his body energy drives outward from his visceral core into his muscles.

The basic energy picture of the hyperope is of energy expansion from the center to periphery, into the limbs, down to the feet, and up through the back of the neck, over and through the top of the head, projecting through the eyes and out onto the environment. The block limits the contractive phase of the pulsation, back into the center, so the hyperope is stuck and holds on the expansive phase, the chest high and filled. The visual region of the brain is at the back of the head, and the expansive flow is directed through this region to the eyes. Visual problems develop in association with the ocular armoring around the eyes which develops to limit and contain the strong forward ocular flow of energy.

The basic energy picture of the myope is of energy contraction from the periphery to the center. There are particular blocks to expansion which limit the flow of energy from the body's visceral core through the genital and pelvic area below, and the top of the chest and neck above. The chest is usually depressed and holds against full inhalation. There is a fundamental block at the back of the neck and head, extending over the scalp. Picture the posture and expression of a child in chronic fear of a parent or teacher. The ocular flow itself is much weakened, and energy flows strongly instead into the throat and jaws, often with heavy sub-vocal thinking. In addition to the obvious head and neck posture, the pelvis is held, usually forward. The testicles are lifted in the male, the buttocks pulled in, and the genital, perineal and anal area contracted in both sexes. The basic armor of the myope, then, is not ocular, but it blocks the ocular flow of energy before it reaches the eyes, and even before it reaches the visual region of the brain at the back of the head.

Although the myopic posture is fearful, it is not often yielding or acquiescent. There is stubbornness and determination expressed in the stiff neck and tense jaw. It expresses a layer of anger present in most myopes that must be freed before the more fundamental fearfulness becomes accessible. Occasionally an 'angry' myope is found, with a high stiff chest. This anger is superficial, easily accessible compared with the deep fear underneath.

Part 3: The Improvement of Vision

The medical and optometric professions have had some success in improving the vision of myopes — more, in fact, than many of the most respected men in the field have acknowledged. This is doubtless because orthodox doctrine is that little genuine improvement in sight without glasses can occur with most people having defective vision, and doctrine is often more important to conservative practitioners than well-documented experimental results by the more venturesome members of the professions dealing with vision.

Table 2 presents example data from a few studies of myopia improvement. To make the data from all studies comparable, I have presented the results in terms of how large the smallest visual acuity test targets were which were read correctly after training, expressed as a per cent of the size (area) of the smallest read before training, both tests being made without glasses, of course. An improvement from 20/40 to 20/20 or from 20/100 to 20/50 would both be classed as 25 per cent, since the smaller targets seen 'after' have 1/4 the area of those seen 'before' in both cases. In the group training experiment of Berens and his co-authors, who employed 30 sessions of Renshaw tachistiscopic techniques, an improvement to about 35 per cent of initial target size was found, about four lines improvement on the test chart used (Berens, *et al.*, 1957). This substantial average improvement was for a group of 80 subjects, and was published in the prestigious *American Journal of Ophthalmology*. The authors are a team of four investigators of repute, three MD's and a psychologist. A control group of 60 subjects failed to improve, as would be expected without the training.

Other techniques bring even greater improvement, as the studies cited confirm. The results of extended Bates training show that the improvements in visual acuity demonstrated in relatively brief group experiments could be greatly extended by prolonged individual Bates training. Part 1 of this article showed that comparable improvements in other visual functions occur with conditions other than myopia as a result of long continued Bates training.

TABLE 2

Effectiveness of visual improvement techniques in myopia; a summary of experimental studies

Reference	*Area of targets seen after training as a percentage of the smallest seen before training*	*Improvement ratio (approx.)*
Optometric group training methods:		
Hildreth, *et al.*, 1947	70%	1.5
Woods, 1946	50%	2.0
Tachistiscopic training:		
Berens, *et al.*, 1957	35%	3.0
Experimental suggestion:		
Fox, 1959	25%	4.0
Kelley, 1958	20%	5.0
Extensive individual Bates training: (four subjects trained 50-200 hours each)		
Kelley, 1958	less than 2%	50.0

It is not yet possible to present data comparing the result of the Interscience Work Shop's new techniques with the results of prior studies. The techniques are too new, and as yet we lack resources necessary for properly controlled experimental research. But the results are striking. Students are improving their vision, some dramatically, and in most cases more quickly than by use of any other techniques with which I am familiar. We expect to be able to demonstrate improvements greater than are possible with the Bates method, both in rate of improvement and final level reached through training. We expect also to show some major improvements in very serious visual conditions, but we want to avoid building anyone's hopes unduly. We give training experimentally to some applicants with severe vision problems when their condition is not communicable, making certain they understand that we can promise nothing. We ask that they have

their eye doctor monitor their progress. We will report our results in these cases, failures and successes alike.

Vision and Feeling

The most important changes taking place in most students are not in vision itself, however, but in the whole person, at the feeling level. When a person has been haunted unconsciously since childhood with the effects of blocked fear, rage, or grief, the release of the blocked emotion brings changes that are usually much more significant to him than the improved vision in itself.

The release of blocked fear brings a freedom and opening out of the student that changes his being profoundly. The deflated chest fills, the posture straightens, and the student faces his life with new confidence. He is better able to express anger or love, both of which were held by the fear block. The voice drops in pitch and becomes more resonant as the throat — which, like the eyes, plays a key role in the fear block — relaxes. Genital tensions relax and the sexual experience deepens. — And the vision improves! There is no experience as significant for bringing vision improvement to the myope as the release of blocked fear.

Similar things can be said about freeing the blocked rage that typifies hyperopia. There is a relaxation and often a lightening of the personality, an opening and brightening, with a new sense of freedom. Frequently there is an outpouring of joy following a particular release session. The head turns more easily as tensions in the back, shoulders and the sides of the neck give way. Perhaps most significant in the long-term view, however, is a centering of the person, a coming into himself, a focusing of his vital energy. The person blocking anger has his energy scattered in the periphery, in his muscular system. Release of the anger block permits the energy to flow back to the center, the body's visceral and plasmatic core. There is a corresponding reduction in peripheral muscle tension. The stiff expanded chest softens and drops. The eyes become softer, opening wider and moving more freely as the local armoring around them disappears. Headaches, double vision, imbalances and incoordinations in the two eyes greatly improve, especially if vision drills to take advantage of the changes are practised.

When it is grief that has been blocked, release of the block results in full and free crying, with no holding back of sound. The freeing of the high chest, throat, jaw, pharynx and eyes as well as the high chest is involved. There is frequently an admixture of fear or rage in crying, in which case the crying will be partial, and may turn into a rage or fear discharge. The 'purest' release of grief does not involve fear or rage, however, but very deep hurt or disappointment that was blocked out of awareness by the armor. Release then results in agonizing sobs and cries from the depths of the being.

The release of grief affects vision significantly. Crying is a discharge of energy through the throat, mouth, nose and the eyes. The lids typically close tight at the peak of a grief discharge, as if to contain the strong outpouring of energy through the eyes. The high chest heaves convulsively, the upper face turns red, and the tears and sounds pour out with full involuntary expirations. After the discharge the eyes are temporarily puffy and red. Emotionally, there is a relief and calm, with an integration of the deep feelings. The expression is serious and open. Eye contact is unusually intense and direct, and the visual surroundings are experienced with unusual vividness. Things of beauty affect the student deeply. He is sensitized, not only to colors and forms, but to emotional expressions. He is strongly aware of where other people are, including their blocks and inhibitions to feeling.

When the opening is sudden and new, the expressions of many people are a shock. People on the street can appear grotesque and agonized. 'To see' in our sense of the word means to become aware of what is there, be it lovely or unlovely.

The release and spontaneous discharge of fear, rage, and grief are central to our vision improvement work, as to our 'education in feeling' program. People ask about the positive emotions: Do we not free them also? — What we free is what is present within the student, of course. Most people must work through negative emotion before reaching the positive. Approaches which endeavor to create joy without first working through pain are of necessity superficial, for no deeply joyous experience is possible when deep fear, rage, or grief is blocked and held in.

And the primary positive emotions are but the 'other side of the coin,' polar opposites of the negative, i.e.,

pain ⟷ pleasure

fear ⟷ trust, receptivity, openness

rage ⟷ joy, love

grief ⟷ mirth, humor

To block a negative emotion from awareness results in blocking the positive that is its polar opposite. To free the one opens the capacity for the other.

The freeing and discharge of feeling is the ground on which our vision improvement work takes place. Opening the feelings does not in itself guarantee measurable changes in vision, though they do occur. Its main function is to make the student much more accessible to specific vision improvement techniques, such as those derived from Bates and from Renshaw.

Our vision improvement work thus includes these four classes of techniques:

1 Neo-Reichian emotional release work, including the Interscience Intensive, for freeing blocks to feeling that affect vision. This is the core of our program.

2 Lowen stress positions and other bioenergetic drills to mobilize the body's energy.

3 Bates vision improvement drills.

4 Renshaw tachistiscopic training, the flashing of visual patterns for a fraction of a second, to be observed and reproduced by the student.

In addition, we are developing some new feeling-oriented vision improvement drills, which we hope will prove of real value. The Bates drills are described by Bates (1920) and Corbett (1949), and our neo-Reichian techniques for the freeing of feeling in Kelley (1970). Our program began as a blending of these.

Our techniques will doubtless change considerably in the years ahead. It is well to remember how young our approach is. It has

been less than three years since the first small group of myopes volunteered to undergo a mixture of Bates and Reichian techniques. This was the inception of our program. Our facility for teaching this work has, of this writing (September 1970) been open less than a year. It has, we believe, been a truly significant year for understanding the nature of, and developing techniques to improve, the major disorders of sight.

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